TENNESSEE PERINATAL CARE SYSTEM

EDUCATIONAL OBJECTIVES FOR NURSES
LEVELS I, II, III
NEONATAL TRANSPORT NURSES

(Third Edition)

January 2004

Tennessee Department of Health
Maternal and Child Health

Phil Bredesen
Governor

Kenneth S. Robinson, M.D.
Commissioner

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Prepared by the
Subcommittee on Regionalization and Care Levels
of the
Perinatal Advisory Committee

January 2004

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INTRODUCTION

These Educational Objectives for Nurses, developed by a group of experienced obstetric and neonatal nurse educators, list the knowledge and skills necessary to provide quality nursing care to mothers and newborns. In this revised (3rd) edition of the Educational Objectives for Nurses, the material has been separated by hospital levels of care and by specialty. Each section can stand alone. Like its predecessor, this manual has been written primarily for nurses practicing in a hospital setting.

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned in basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings. It is the responsibility of Tennessee's Regional Perinatal Centers to assist practicing nurses in obtaining the knowledge and skills necessary to provide quality care. Thus, nurse educators at each of the Regional Perinatal Centers are always available to consult in the development of educational programs or to actually provide such programs.

Educators will find that much has been left to their judgment. These objectives must be adapted to meet the needs of individuals in terms of sequence of presentation, time allotment to individual topics, and modalities of presentation. Information contained in the most recent editions of the Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities and the Guidelines for Transportation, both published by the Tennessee Department of Health, Maternal and Child Health Section, should be used to supplement this material.

In publishing this revised (3rd) edition of the Educational Objectives for Nurses, it is hoped that they will be used to prepare nurses for providing the best possible care to low and high risk mothers and newborns.

OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL I FACILITIES

OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL I FACILITIES

The nurse caring for obstetric patients in a Level I facility should be able to:

PRECONCEPTIONAL

I. Demonstrate an understanding of significant issues related to the preconceptional period.

A. Describe the anatomy and physiology of the non-pregnant reproductive system.

B. Describe the menstrual cycle.

C. Explain the process of conception, including fertilization and implantation.

D. Identify indications for preconceptional counseling.

PRENATAL

II. Demonstrate an understanding of significant issues related to the prenatal period.

A. Describe maternal physiologic changes of pregnancy by both organ system and trimester of pregnancy.

B. Identify alterations in values associated with pregnancy in commonly ordered laboratory tests.

C. Describe psychosocial adaptations made by the typical family to pregnancy.

D. Describe the stages of fetal growth and development.

E. Discuss the importance of good nutrition in pregnancy.

F. Explain the maternal and fetal effects of substance use/abuse during pregnancy.

G. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the history and physical assessment.

H. Identify indications for and the significance of common maternal-fetal assessment techniques. Examples are:

1. non-stress testing
2. biophysical profile

I. Identify the essential components that should be included in prenatal and childbirth education.

J. Explain the importance of screening for domestic violence in the pregnant woman.

K. Identify indications and resources for prenatal referral.

INTRAPARTAL

III. Demonstrate an understanding of significant issues related to the intrapartal period.

A. Identify the risk status of mother and fetus based on a review of recent history, laboratory data, and a physical assessment, including labor evaluation and pelvic examination, if indicated.

B. Describe the stages and phases of labor.

C. Describe maternal physiologic and psychologic responses to labor.

D. Evaluate the fetal response to labor.

E. Evaluate and promote maternal and fetal well-being, based on assessment of fetal monitor tracings.

F. Outline appropriate emotional and physical support for the laboring woman and her support structure.

G. Describe the response of the mother and fetus to commonly used analgesics and types of anesthesia.

H. Identify indications, procedures, and protocols for cervical ripening and/or labor induction/augmentation.

I. Describe nursing management of the surgical obstetric patient, both intraoperatively and postoperatively.

J. Identify, stabilize, and manage the patient with intrapartal complications and recognize indications for referral. Examples of complications include:

1. preterm labor
2. premature rupture of membranes
3. hypertensive disorders
4. infectious diseases
5. acute obstetric emergencies
6. trauma

K. Explain the role of the nurse in assisting with the spontaneous vaginal delivery.

L. Describe appropriate procedure for initial assessment and resuscitation of the newborn.

M. Identify indications and resources for intrapartal referral.

POSTPARTAL

IV. Demonstrate an understanding of significant issues related to the postpartal period.

A. Identify the risk status of the postpartal woman based on a review of recent history, including a labor and delivery summary, laboratory data, and a physical assessment.

B. Describe maternal physiologic and psychologic adaptation to the postpartal period.

C. Outline the emotional and physical support necessary for the postpartal woman and her significant others.

D. Describe measures to promote infant safety during the hospital stay.

E. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.

F. Describe nursing care for the breast and/or bottle feeding mother, including strategies to promote success.

G. Describe the risks and benefits of various methods of contraception.

H. Develop, implement, and document postpartal education, including maternal and infant care and family adaptation.

I. Recognize the stages of grief and support the family during the process.

1. Identify normal and pathologic responses to grief.
2. Describe the techniques of intervention with families experiencing grief.
3. Institute appropriate referrals as necessary.

J. Identify, stabilize, and manage the patient with postpartal complications and recognize indications for referral.

CONSULTATION/REFERRAL

V. Demonstrate an understanding of significant issues related to consultation and/or referral during the perinatal period.

A. Identify common indications for consultation regarding care and/or transport of the high risk mother or fetus.

B. Describe the process for initiating consultation/referral with the Regional Perinatal Center.

C. Outline stabilization measures commonly used either prior to or during transport.

NEONATAL OBJECTIVES FOR NURSES IN LEVEL I FACILITIES

NEONATAL OBJECTIVES FOR NURSES IN LEVEL I FACILITIES

The nurse caring for neonatal patients in a Level I facility should be able to:

I. Identify those maternal risk factors in the preconceptional and intrapartal periods that place the fetus and/or neonate at risk.

II. Describe the significance of normal and abnormal results for state-of-the-art preconceptional fetal assessment.

III. Describe the significance of baseline fetal monitor information and variations in the fetal heart rate pattern.

IV. Identify pharmacologic agents commonly used by the obstetric patient, assess their effects on the fetus and neonate, and plan care in the well baby nursery.

V. Identify normal fetal circulation and describe the physiologic changes that occur at birth.

VI. Manage the neonate's response to extrauterine life.

A. Assign the appropriate 1 and 5 minute Apgar scores.

B. Establish priorities for assessment based on maternal history, labor-delivery history, and neonatal status.

C. Manage neonatal resuscitation according to the latest edition of the Textbook of Neonatal Resuscitation published by the American Heart Association and the American Academy of Pediatrics.

D. State the rationale and procedure for administering prophylactic eye medication to the neonate.

E. State the rationale and procedure for administering Vitamin K to the neonate.

VII. Identify the physiologic changes that occur during the transitional period.

VIII. Perform a comprehensive and systematic assessment of the neonate and take action based on findings.

A. State the homeostatic range for the following during neonatal life:

1. temperature
2. heart rate
3. respiratory rate
4. blood pressure
5. hematocrit/hemoglobin
6. blood glucose

B. When given a neonate to assess, identify normal physical characteristics and common variations related to:

1. body contour, proportions, and posture
2. head (including occipital frontal circumference, names of fontanelles and sutures)
3. face (including mouth and nose)
4. eyes
5. ears (hearing screening)
6. skin
7. chest
8. abdomen
9. genitalia and rectum
10. extremities
11. vertebral column
12. reflexes

C. When given a neonate to assess:

1. identify, describe and locate point of maximal impulse of the heart
2. count and record apical heart rate
3. identify obvious heart murmurs
4. auscultate the lungs to identify normal and abnormal breath sounds
5. describe skin texture, color, and perfusion
6. identify flaring of the nostrils, retractions, grunting, and inspiratory stridor, and relate the significance of these findings to problems experienced by the neonate
7. identify the placement and strength of brachial and femoral pulses
8. describe abdominal girth and shape, bowel sounds, stooling pattern, and voiding pattern
9. describe level of consciousness, activity, and comfort
10. measure and record vital signs
11. measure and record blood glucose
12. describe signs and symptoms of trauma, congenital anomaly, and infection
13. perform a complete physical assessment, record findings, identify patient needs, and initiate appropriate action based upon findings

IX. Accurately determine the gestational age of a neonate by using a standardized scoring system.

A. Define the following terms:

1. term neonate
2. preterm neonate
3. post-term neonate
4. small for gestational age
5. large for gestational age
6. appropriate for gestational age

B. Determine the gestational age of a neonate.

C. Describe problems associated with preterm and post-term birth.

D. Describe early stabilization, assessment, and transfer plans for gestational age ≤34 weeks.

E. Determine a neonate's growth classification by plotting the birthweight, head circumference, and length on the intrauterine growth chart.

F. When given a simulated or actual patient situation, state the significance of abnormal intrauterine growth.

X. Apply knowledge of thermoregulation through assessment of the neonate's temperature status and maintenance of an optimal thermal environment.

A. Define thermal balance.

B. List four physiologic characteristics in the neonate which influence heat loss and describe how each characteristic influences heat loss.

C. List four modes of heat transfer in the neonate, give an example of how each occurs, and identify interventions to decrease heat transfer by each of the four modes.

D. When given a hypothetical or actual patient situation, identify measures to prevent heat loss by each of the four modes.

E. Describe the physiologic process by which the neonate attempts to maintain body temperature.

F. List major physiologic problems which may result from cold stress.

G. List major physiologic problems associated with hyperthermia of the neonate.

H. Identify optimal skin and axillary temperatures for both premature and term neonates.

I. Compare and contrast methods for monitoring a neonate's temperature with regard to safety and accuracy.

J. Compare and contrast methods of providing external heat for the neonate and identify advantages and disadvantages of the following:

1. incubator
2. radiant warmer
3. servocontrol
4. manual control
5. heat packs and mattresses

K. Describe safe methods of increasing and decreasing a neonate's temperature.

L. Provide a thermal environment for the neonate which minimizes metabolic activity.

M. Plan nursing care to maintain an optimal temperature.

N. Utilize all thermoregulation equipment safely.

XI. Assess the neonate's fluid and nutritional needs based upon gestational age, growth and weight.

A. Recognize fluid, nutritional, and caloric needs of the term neonate based upon weight and postnatal age.

B. Describe gestational age, growth, muscle activity, level of consciousness, and cardiorespiratory patterns associated with nipple feeding success.

C. Initiate feedings based on physiologic readiness.

D. Describe techniques for encouraging optimal feeding and nutrition of the well term and near term neonate.

E. Describe methods of identifying adequate hydration in the hospital and the home.

F. Identify measures which minimize fluid loss in the healthy, growing infant and the neonate being prepared for transport.

XII. Identify respiratory problems and initiate emergency and supportive care until transport of the neonate can be accomplished.

A. List four physiologic changes which must occur at birth in order for the lungs to function and provide oxygenation.

B. When given a neonate to assess, differentiate between a normal and abnormal respiratory assessment.

C. Auscultate the heart to identify, record, and report:

1. shift of mediastinum to right or left
2. obvious murmurs
3. persistent tachycardia
4. bradycardia
5. abnormal rhythm

D. Describe indications for oxygen therapy, methods for delivering oxygen to the neonate, and appropriate use of oxygen analyzers, saturation monitors, and arterial blood gases.

E. Briefly describe the pathogenesis and management of pulmonary and non-pulmonary respiratory distress.

XIII. Evaluate the neonate for inappropriate glucose metabolism and take appropriate action based upon findings.

A. Recognize in clinical practice normal depletion of glycogen stores and initiate routine monitoring and reporting techniques to identify problems.

B. List sources and storage reservoirs for fetal and neonatal glucose.

C. Identify neonates at risk for hypoglycemia based on maternal history, birthweight, gestational age, neonatal pathology, and symptoms of hypoglycemia.

D. Utilize history and physical assessment to plan glucose screening.

E. Utilize nursing measures to correct and maintain blood glucose levels within the normal range by:

1. administering feedings as prescribed
2. administering glucose based on the neonate's blood glucose level and physician's order

XIV. Plan, provide and evaluate the nursing care of neonates with hyperbilirubinemia.

A. Define direct reacting bilirubin (conjugated bilirubin, bilirubin glucuronide), indirect reacting bilirubin (unconjugated bilirubin), and total bilirubin.

B. Describe the metabolism of bilirubin.

C. Describe the mechanism responsible for physiologic jaundice.

D. List the criteria for differentiating physiologic and pathologic jaundice in the neonate.

E. Describe briefly the mechanism by which phototherapy decreases bilirubin levels.

F. Correctly administer phototherapy to provide maximum effect and to decrease and/or lessen the side effects of therapy.

G. Identify indications and rationale for exchange transfusions.

XV. Plan, provide and evaluate nursing care for neonates with selected hematological disorders.

A. State the normal circulating blood volume in the neonate.

B. Identify the normal laboratory values of the following tests:

1. hematocrit/hemoglobin
2. reticulocyte count
3. platelet count
4. Coombs test

C. List common causes of hemolytic and hemorrhagic anemia in the newborn during the first day of life.

D. List the symptoms and laboratory data characteristics of acute and chronic anemia.

E. Identify the factors which indicate the need for a Coombs test, type, Rh, and reticulocyte count.

F. Discuss the pathogenesis of Rh and ABO incompatibility.

XVI. Identify common sources for perinatal infections, symptoms of infections, and methods to prevent nosocomial infections.

A. Identify sources of congenital and nosocomial infections.

B. Describe the pathogenesis of common perinatal infections.

C. Identify and report symptoms of septicemia in the neonate.

D. List the normal white blood count, differential, and platelet count in the neonate.

E. Identify antimicrobial agents appropriate for community-acquired neonatal colonization.

F. Calculate the correct dosage of antibiotics used to treat infection based upon an approved dose.

G. Describe initial management of the septic neonate awaiting transport.

H. Describe rationale for and appropriate implementation of universal precautions.

XVII. Evaluate the neonate for gastrointestinal problems, record findings, and initiate action based upon findings.

A. List clinical signs of normal gastrointestinal dysfunction in the first 48 hours of life.

B. Describe signs and symptoms of pathology which would indicate the need for:

1. holding feedings
2. stopping feedings
3. gastric aspiration
4. gastric suction
5. Hematest on stools
6. suppository
7. changing of infant’s position
8. protective covering of exposed organs

C. Identify pathogenesis, presentation, and early management of gastrointestinal atresias, fistulas, obstructions, and abdominal wall defects.

XVIII. Implement the concept of family-centered care, utilizing current concepts in parent-infant attachment.

XIX. Recognize the stages of grief and effectively support the family during this process.

A. Identify both normal and pathologic responses to grief.

B. Describe techniques of intervention with families experiencing grief.

C. Intervene therapeutically and institute appropriate referrals.

XX. Describe a parent education program which includes baby care, safety, prevention of abduction, and growth and development through infancy.

XXI. Discuss current state laws related to hospital care of the neonate.

A. Explain the rationale for newborn metabolic screening.

B. Explain the rationale for child safety regulations and the role of the nurse in implementing them.

XXII. Discuss the history, principles, and purpose of perinatal health care regionalization.

XXIII. Identify responsibilities of the community hospital and the individual nurse in the regionalization process.

XXIV. Demonstrate an understanding of significant issues related to consultation and/or referral during the neonatal period.

A. Identify common indications for consultation regarding care and/or transport of the high-risk neonate.

B. Describe the processing for initiating consultation/referral with the appropriate referral center.

C. Outline stabilization measures commonly used either prior to or during transport.

D. Utilize the most recent edition of the Tennessee Perinatal Care System Guidelines for Transportation as the basis for planning and managing transfer.

OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL II FACILITIES

OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL II FACILITIES

The nurse caring for obstetric patients in a Level II facility should be able to:

PRECONCEPTIONAL

I. Demonstrate an understanding of significant issues related to the preconceptional period.

A. Describe the anatomy and physiology of the non-pregnant reproductive system.

B. Describe the menstrual cycle.

C. Explain the process of conception, including fertilization and implantation.

D. Identify indications for preconceptional counseling.

PRENATAL

II. Demonstrate an understanding of significant issues related to the prenatal period.

A. Describe maternal physiologic changes of pregnancy by both body system and trimester of pregnancy.

B. Identify alterations in laboratory values associated with pregnancy.

C. Describe psychosocial adaptations made by the family to both low and high-risk pregnancy.

D. Describe the effects of exposure to teratogens on the fetus at each stage of fetal growth and development.

E. Describe the importance of good nutrition in pregnancy.

F. Explain the maternal and fetal effects of substance use/abuse during pregnancy.

G. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the history and physical assessment.

H. Identify indications for and the significance and interpretation of currently used and newly developing maternal-fetal assessment techniques. Examples are:

1. high resolution ultrasonography
2. fetal lung maturity studies
3. chromosomal evaluation
4. biophysical profile

I. Identify components which should be included in comprehensive prenatal and childbirth education.

J. Explain the importance of screening for domestic violence in the pregnant woman.

K. Identify indication and resources for prenatal referral.

INTRAPARTAL

III. Demonstrate an understanding of significant issues related to the intrapartal period.

A. Identify the risk status of mother and fetus based on a review of recent history, laboratory data, and a physical assessment, including labor evaluation and pelvic examination, if indicated.

B. Describe the stages and phases of labor.

C. Describe maternal physiologic and psychologic responses to labor.

D. Evaluate the fetal response to labor.

E. Explain and promote maternal and fetal well-being, based on assessment of fetal monitor tracings.

F. Outline appropriate emotional and physical support for the laboring woman and significant others.

G. Describe the responses of the mother and fetus to commonly used analgesics and types of anesthesia.

H. Identify indications, procedures, and protocols for cervical ripening and/or labor induction/augmentation.

I. Describe nursing management of the surgical obstetric patient, both intraoperatively and postoperatively.

J. Identify, stabilize, and manage the patient with intrapartal complications and recognize indications for referral. Examples of complications include:

1. preterm labor
2. premature rupture of membranes
3. hypertensive disorders
4. infectious diseases
5. acute obstetric emergencies
6. trauma

K. Explain the role of the nurse in assisting with the spontaneous vaginal delivery.

L. Describe appropriate procedure for initial assessment and resuscitation of the newborn.

M. Identify the legal implications of perinatal nursing, including appropriate documentation.

N. Identify indications and resources for intrapartal referral.

POSTPARTAL

IV. Demonstrate an understanding of significant issues related to the postpartal period.

A. Identify the risk status of the postpartal woman based on a review of recent history, including a labor and delivery summary, labor data, and a physical assessment.

B. Describe maternal physiologic and psychologic adaptation to the postpartal period.

C. Outline emotional and physical support necessary for the postpartal woman and her significant others.

D. Identify measures to promote infant safety during the hospital stay.

E. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.

F. Describe nursing care for the breast and/or bottle feeding mother, including strategies to promote success.

G. Describe the risks and benefits of various methods of contraception.

H. Develop, implement, and document postpartal education, including maternal and infant care and family adaptation.

I. Recognize the stages of grief and support the family during the process.

1. Identify normal and pathologic responses to grief.
2. Describe techniques of intervention with families experiencing grief.
3. Institute appropriate referrals as necessary.

J. Identify, stabilize, and manage the patient with postpartal complications and recognize indications for referral.

CONSULTATION/REFERRAL

V. Demonstrate an understanding of significant issues related to consultation and/or referral during the perinatal period.

A. Identify common indications for consultation regarding care and/or transport of high-risk mother or fetus.

B. Describe the process of initiating consultation/referral with the Regional Perinatal Center.

C. Outline stabilization measures commonly used either prior to or during transport.

NEONATAL OBJECTIVES FOR NURSES IN LEVEL II FACILITIES

NEONATAL OBJECTIVES FOR NURSES IN LEVEL II FACILITIES

The nurse caring for neonatal patients in a Level II facility should be able to:

I. Identify factors from an obstetric history which might cause fetal compromise and evaluate the neonate for physiologic distress.

A. Describe the physiologic changes in the mother which occur during labor.

B. Given patient situations, identify neonates at risk as a result of precipitous or prolonged labor.

C. Identify the most common examples of fetal malpresentation and describe neonatal problems which might result from each.

D. Given maternal histories, identify maternal problems which might result in a preterm birth.

E. Identify maternal, fetal, and iatrogenic problems which might result in fetal asphyxia.

F. Given a variety of fetal heart rate monitor patterns, identify fetal/neonatal sequelae which might result from each.

G. Describe appropriate antepartal and intrapartal fetal surveillance tests and interpret results.

H. Given a hypothetical situation, identify neonatal sequelae related to:

1. placental abnormalities
2. maternal hypertensive disorders
3. maternal metabolic abnormalities
4. maternal age
5. maternal chemical dependency
6. maternal social-sexual history
7. preexisting maternal medical conditions
8. maternal medications and anesthetics
9. multiple gestation
10. maternal smoking

I. Develop an appropriate neonatal plan of care based on an understanding of the maternal history.

II. Discuss in detail fetal circulation and identify the physiologic changes that occur at birth.

A. Using a diagram, trace blood through the entire fetal circulation and identify the sites of venous admixture that are unique to the fetus.

B. Identify or describe the changes which occur at birth in the neonate's cardiovascular system and state the rationale for each change.

C. State the role of the placenta in gas exchange.

D. Describe maternal, fetal, and environmental factors which influence placental exchange.

E. Explain the interrelationships of blood flow, pressure, and resistance.

F. List the effects of the following on resistance in all vascular beds:

1. pH
2. PO_2/SaO_2
3. PCO_2
4. prostaglandins

III. Manage the newborn's transition to extrauterine life.

A. Manage early transition and resuscitation as specified in the most recent edition of the Textbook of Neonatal Resuscitation published by AHA and AAP.

B. Given patient situations, develop a plan of care that would allow early recognition and management of sequelae from asphyxia and cardiopulmonary resuscitation, including consultation and referral when indicated.

C. Develop a management plan for the moderately ill neonate that would enhance transition from the fetal cardiopulmonary circuit to the neonatal cardiopulmonary circuit.

IV. Perform a comprehensive and systematic assessment of the neonate and take action based on findings.

A. Identify factors that influence the homeostatic range for the following during neonatal life:

1. temperature
2. heart rate
3. respiratory rate and pattern
4. blood pressure
5. hematocrit/hemoglobin
6. blood glucose

B. When given a neonate to assess, identify normal physical characteristics and common variations related to:

1. body contour, proportions, and posture
2. head (including occipital frontal circumference, names of fontanelles and sutures)
3. face (including mouth and nose)
4. eyes
5. ears
6. skin
7. chest

8. abdomen
9. genitalia and rectum
10. extremities
11. vertebral column
12. reflexes

C. When given a neonate to assess:

1. identify, describe, and locate point of maximal impulse of the heart
2. count and record apical heart rate
3. identify obvious heart murmurs
4. auscultate the lungs to identify normal and abnormal breath sounds
5. identify flaring of the nostrils, retractions, grunting, inspiratory stridor, apnea, and choanal atresia, and relate the significance of these findings to problems experienced by the neonate
6. identify placement and strength of brachial and femoral pulses
7. describe abdominal girth and shape, stooling pattern, and voiding pattern
8. describe skin turgor, texture, color, and perfusion
9. describe level of consciousness, activity, and comfort
10. measure and record vital signs
11. measure and record blood glucose
12. perform a complete physical assessment, record findings, identify patient needs, and initiate appropriate action based upon findings

D. Establish a plan for stabilization of all infants and appropriate management of moderately ill infants.

E. Describe an education plan that includes infant assessment by the parent at home.

V. Accurately determine the gestational age of a neonate by using a standardized scoring system.

A. Define the following terms:

1. term neonate
2. preterm neonate
3. postterm neonate
4. small for gestational age
5. large for gestational age
6. appropriate for gestational age
7. low birth weight
8. very low birth weight

B. Define the significance of symmetry in maturity and growth of the neonate.

C. Identify those factors in a maternal history which increase risk for growth and gestational age complications.

D. Determine the gestational age of a neonate.

E. Determine a neonate's growth classification by plotting the birthweight, head circumference, and length on the intrauterine growth chart.

F. State the major implications of abnormal intrauterine growth.

G. Given a variety of patient gestational ages and growth parameters, develop a plan of care which reflects consideration of these issues, including the need for consultation and referral as appropriate.

VI. Apply knowledge of thermoregulation through assessment of the neonate's temperature status and maintenance of an optimal thermal environment.

A. Define thermal balance.

B. List four physiologic characteristics in the neonate which influence heat loss and describe how each characteristic influences heat loss.

C. List four modes of heat transfer in the neonate, give an example of each, and identify interventions to decrease heat transfer by each of the four modes.

D. When given a patient situation, identify measures to promote a neutral thermal environment.

E. Describe the physiologic processes by which the neonate attempts to maintain body temperature.

F. List major physiologic problems which may result from hypo- and hyperthermia.

G. Identify optimal skin and axillary temperatures for both premature and full-term neonates.

H. Compare and contrast methods for monitoring a neonate's temperature with regard to safety and accuracy.

I. Compare and contrast methods of providing external heat for the neonate, including:

1. incubator
2. radiant warmer
3. servocontrol
4. manual control
5. heat packs and mattresses

J. Describe safe methods of increasing and decreasing a neonate's temperature.

K. Identify factors other than body temperature which may indicate the status of the neonate's thermal balance.

L. Utilize theoretical knowledge of thermoregulation to provide an optimal ambient temperature, relative humidity and wind velocity for the neonate.

M. Utilize all thermoregulation equipment safely.

N. Describe appropriate long-term thermal management of the neonate.

O. Describe an education plan that includes appropriate temperature assessment and management by the parents.

VII. Manage the neonate's fluid and nutritional needs based upon gestational age.

A. Calculate the fluid and caloric needs of the neonate based upon weight, age, physiologic problems, and rate of growth.

B. Calculate the appropriate protein, fat, carbohydrate, mineral, and vitamin content for formula needed by a neonate.

C. Discuss the indications and contraindications for initiating feeding.

D. When total oral feeding is not an option, develop a plan of care to meet fluid, electrolyte, and nutritional needs, including the use of hyperalimentation.

E. Describe the appropriate use of human milk, supplements, and commercial formula to meet fluid, nutrient, mineral, and vitamin requirements of neonates.

F. Evaluate a neonate's postnatal growth using a postnatal growth chart and identify appropriate management responses.

G. Develop a plan to teach parents appropriate oral nutrient and fluid sources and indications that consultation is necessary to alter oral intake.

VIII. Select the most appropriate technique for feeding the high-risk infant.

A. List advantages and disadvantages of continuous gastric, intermittent gastric, and nipple feeding based on knowledge of the infant's physiologic status, gestational age, and weight.

B. Describe safe and effective procedures for feeding infants receiving continuous gastric, intermittent gastric, gastrostomy, and/or nipple feedings.

C. Recognize and report signs of feeding intolerance and differentiate iatrogenic problems from actual changes in the infant's clinical status.

D. Describe the correlation of blood glucose levels to the neonate's feeding regimen.

E. List measures to decrease oxygen consumption, trauma, infection, air ingestion, vomiting, and aspiration in relationship to feeding techniques.

F. Describe methods for assisting the mother of a sick infant with feeding techniques.

IX. Correctly administer intravenous fluids.

A. Calculate the fluid needs of the neonate, based upon weight, age, and physiologic status.

B. Describe iatrogenic causes of the following:

1. overhydration
2. underhydration
3. infection at intravascular sites
4. clotting of intravascular lines
5. hemorrhage
6. hypoglycemia
7. hyperglycemia
8. infiltration
9. embolism
10. thrombosis

C. Describe nursing measures that will enhance the positive effects and minimize the side effects of the following:

1. glucose and electrolyte solutions
2. umbilical venous and arterial lines
3. peripheral intravenous lines
4. percutaneously inserted central catheter
5. central venous line

X. Anticipate and identify fluid and electrolyte imbalance in the sick neonate.

A. Define fluid and electrolyte loads for moderately ill neonates.

B. Recognize clinical histories, major signs, symptoms, laboratory values, and appropriate intervention for the following:

1. shock
2. insensible water loss
3. Syndrome of Inappropriate Anti-Diuretic Hormone Secretion (SIADH)
4. renal insufficiency or failure
5. moderate sodium and potassium imbalance

C. Recognize abnormal electrolyte values and differentiate those abnormal values which require immediate medical intervention from those which require more frequent or thorough assessment without immediate intervention.

XI. Apply knowledge of acid-base balance in the management of the moderately ill newborn.

A. Identify pathophysiologic changes which result from acidosis and alkalosis.

B. Define pH, acid, base, base excess, and buffer.

C. Describe how blood, respiratory, and renal buffers compensate for acid-base imbalance.

D. Identify acceptable neonatal parameters for blood gas values (pH, PO_2, PCO_2, HCO_3, base excess, and oxygen saturation).

E. Compare the clinical significance of blood gases obtained from the following sites: capillary, peripheral artery puncture, umbilical artery, and pulse oximetry.

F. Differentiate abnormal blood gases that require a change in therapy from those that do not require a change in therapy.

G. Recognize blood gas reports that indicate the following:

1. compensated and uncompensated metabolic acidosis
2. compensated and uncompensated metabolic alkalosis
3. compensated and uncompensated respiratory acidosis
4. compensated and uncompensated respiratory alkalosis
5. mixed metabolic and respiratory imbalances

H. Describe the etiology of acid-base imbalances in relation to gain or loss of fixed acid, gain or loss of base, gain or loss of carbon dioxide.

I. Describe the relationship of the following to acid-base balance (pH) and measures to optimize each factor.

1. PO_2,PCO_2, base excess
2. diffusion gradient/O_2 and CO_2 sources
3. respiratory rate/drive
4. FRC/air trapping/atelectasis
5. tidal volume/diffusing surface
6. blood flow
7. Hgb function
8. nutrient metabolism
9. infant and ambient temperature
10. infant activity and sleep pattern
11. urinary and GI losses

XII. Apply knowledge of respiratory physiology in the management of newborns with respiratory disorders. (If the hospital provides protracted mechanical ventilation, see the educational objectives for neonatal nurses working in Level III facilities.)

A. List physiologic events which must occur at birth in order for the lungs to function postnatally and list factors responsible for each event.

B. Describe nursing measures which would enhance cardiopulmonary function at birth.

C. Describe physiologic factors in the premature neonate which limit respiratory function at birth.

D. Describe the etiology of the pathophysiologic changes which occur in the following: hyaline membrane disease, transient tachypnea of the newborn, apnea

of prematurity, air leak syndromes, pneumonia, aspiration syndromes, and persistent pulmonary hypertension of the newborn.

E. Describe specific observations and radiologic findings which may assist in identifying the problems listed above.

F. Recognize indications for supplemental oxygen, continuous positive airway pressure (CPAP), intubation, and assisted ventilation.

G. Describe safe management of oxygen, CPAP, chest physiotherapy, airway suction, and endotracheal tube.

H. Describe a plan for the safe use of respiratory monitoring and support devices.

I. Identify and define common terms associated with ventilator therapy.

J. Describe safe methods of adjusting respiratory support based on the clinical condition of the neonate, blood gases, and radiologic findings.

XIII. Demonstrate theoretical knowledge of the most common cardiac disorders that occur during the newborn period.

A. Describe common cyanotic and acyanotic heart defects in the newborn period.

B. Describe the physiologic problems associated with patent ductus arteriosus.

C. Identify the data base which is necessary to differentiate heart disease from respiratory disease.

D. Describe the indications, mechanism of action, and side effects of common pharmacologic agents used in the management of cardiopulmonary disease.

XIV. Plan, provide, and evaluate the nursing care of newborns with hematologic disorders.

A. Identify normal neonatal values for the following tests:

1. hematocrit
2. hemoglobin
3. platelets
4. bilirubin (total and direct)
5. reticulocyte count
6. Coombs test
7. normal circulating blood volume
8. red cell morphology

B. Correlate lab data with sampling technique, infant's pathology, gestational age, weight, and treatment, and report immediately any unusual findings.

C. Discuss each of the following disease processes, including etiology, signs and symptoms, laboratory data, and management plan:

1. Rh and ABO incompatibility
2. acute anemia
3. chronic anemia
4. thrombocytopenia
5. pathologic jaundice
6. physiologic jaundice
7. vitamin K deficiency
8. polycythemia
9. DIC

D. Describe briefly the mechanism by which phototherapy decreases bilirubin levels.

E. Describe methods of providing phototherapy that will enhance the positive effects and diminish the side effects of this therapy.

F. Describe indications for and appropriate management of transfusions and exchange transfusions.

G. Describe the appropriate use of pharmacologic agents for hematologic disorders.

H. Describe signs, symptoms, laboratory values, and treatment requirements that would indicate the need for consultation or transfer.

I. Recognize the components of and the rationale for newborn hemoglobinopathy screening in the state of Tennessee.

XV. Plan, provide, and evaluate the nursing care of newborns with selected metabolic disorders.

A. Describe the normal pattern of serum glucose changes in the newborn period and utilize this information in planning glucose screens for well term neonates.

B. Identify infants at risk for abnormalities in glucose metabolism and plan glucose screening appropriate to the risk factor.

C. Describe a safe and effective treatment plan for moderately ill infants who have abnormal glucose metabolism.

D. Identify infants at risk for abnormalities in calcium and magnesium metabolism.

E. Identify abnormal serum calcium and magnesium levels from lab reports and differentiate those that require immediate intervention from those which should be further monitored.

F. Demonstrate awareness of rare metabolic disorders which require immediate consultation and/or referral.

G. List the components of and the rationale for newborn metabolic screening in the state of Tennessee.

XVI. Plan, provide, and evaluate the nursing care of newborns with gastrointestinal disorders.

A. Characterize the functional limitations of the preterm and term neonates' gastrointestinal tract.

B. List major clinical symptoms of gastrointestinal dysfunction.

C. Identify problems outside the gastrointestinal tract which will alter digestion, absorption, and motility.

D. When given a patient situation, differentiate between signs and symptoms of upper and lower gastrointestinal obstructions.

E. When given a hypothetical situation, identify therapeutic measures that will alleviate or diminish gastrointestinal problems.

F. Describe signs and symptoms of pathology which would indicate the need for:

1. holding feedings
2. stopping feedings
3. gastric aspiration
4. gastric suction
5. Hematest on stools
6. reducing substances test on stools
7. suppository
8. changing of infant's position
9. protective covering of exposed organs

G. Discuss the pathogenesis and emergent management of necrotizing enterocolitis, intestinal obstructions, and congenital anomalies of the gastrointestinal tract.

H. Describe a teaching plan that would assist parents in notifying the physician appropriately about gastrointestinal dysfunction.

XVII. Identify common sources of perinatal infections, clinical indications of infections, and methods to prevent nosocomial infections.

A. Identify major pathways of congenital and nosocomial infections.

B. Utilize maternal history as a basis for planning neonatal infectious disease screening and management.

C. Identify signs and symptoms of localized and systemic congenital and nosocomial infections in the neonate.

D. Describe how the neonate's immune response and normal development predispose to infection and affect laboratory values.

E. Identify those laboratory values related to screening for infection that require immediate intervention as opposed to monitoring.

F. Describe a safe and effective stabilization/referral plan for the neonate experiencing or at risk for septicemia.

XVIII. Plan and implement measures to protect neurosensory function and to evaluate the infant's response to care.

A. Describe major differences in the neurologic function of the preterm, term, and older infant.

B. Identify disorders outside the nervous system which alter function of the nervous system.

C. Describe and implement a comprehensive assessment plan which will provide for prevention, early identification, and prompt treatment of sensory neural disorders.

1. reflexes
2. posture
3. activity and movement
4. level of consciousness
5. rest and sleep
6. comfort, irritability, pain
7. vision
8. hearing

D. Identify and describe seizure activity and delineate a plan for safe administration of anticonvulsants.

E. Briefly describe symptoms, stabilization techniques, and prognosis of:

1. microcephaly
2. major chromosomal abnormalities (Trisomy 13-15, 18, 21)
3. congenital and acquired hydrocephaly
4. infection of the central nervous system (prenatal and postnatal)
5. neural tube defects
6. intracranial hemorrhage
7. neurologic sequelae of drugs, hypoxia, acid-base imbalance, electrolyte imbalance, and metabolic disorders
8. cerebral edema with or without inappropriate ADH

F. Describe an education plan that includes parent recognition of appropriate sensory neural function, necessity for continuing medical assessment, and interventions appropriately used by parents.

XIX. Utilize knowledge of neonatal pharmacology to optimize desired drug actions and minimize side effects.

XX. Describe a management and education plan that promotes infant safety in the hospital and the community for the following:

A. Falls

B. Thermal injury

C. Abuse

D. Trauma while being carried by caretaker

E. Vehicular transport trauma

F. Drowning

G. Asphyxiation

H. Infectious disease

XXI. Utilize parent-infant attachment concepts in dealing with families of sick newborns.

A. Identify prenatal and postnatal factors which may influence parental attachment and caretaking.

B. Recognize and describe behaviors which indicate the status of parent-infant attachment, including the significance of these behaviors.

C. Recognize and describe the stages of the grief process.

D. Describe how the grief process may influence family relationships.

E. Plan and implement nursing measures which will facilitate healthy completion of the grief process.

F. Describe how attitudes of “significant others” influence parental attachment.

G. Plan and implement nursing measures which will facilitate parent-infant interaction.

H. Utilize community resources for various aspects of home care support.

XXII. Demonstrate an understanding of significant issues related to consultation and/or referral during the neonatal period.

A. Describe the interactive roles of health care disciplines in providing care to neonates and their families.

B. Identify common indications for consultation regarding care and/or transport of the high-risk neonate.

C. Describe the process for initiating consultation/referral with the Regional Perinatal Center.

D. Outline stabilization measures commonly used either prior to or during transport.

OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL III FACILITIES

OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL III FACILITIES

The nurse caring for obstetric patients in a Level III facility should be able to:

PRECONCEPTIONAL

I. Demonstrate an understanding of significant issues related to the preconceptional period.

A. Describe the anatomy and physiology of the non-pregnant reproductive system.

B. Describe the menstrual cycle.

C. Explain the process of conception, including fertilization and implantation.

D. Identify indications for preconceptional counseling, including both medical and genetic factors.

E. Describe therapeutic modalities commonly employed in the treatment of infertility.

F. Identify the psychosocial impact of a history of infertility on the couple experiencing a subsequent pregnancy.

PRENATAL

II. Demonstrate an understanding of significant issues related to the prenatal period.

A. Describe maternal physiologic changes of pregnancy by both body system and trimester of pregnancy.

B. Identify alterations in laboratory values associated with both low and high-risk pregnancy.

C. Describe psychosocial adaptations made by the family to both normal and high-risk pregnancy.

D. Describe the effects of exposure to teratogens on the fetus at each stage of fetal growth and development.

E. Discuss the importance of good nutrition in pregnancy.

F. Explain the maternal and fetal effects of substance use/abuse during pregnancy.

G. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the pregnancy history, laboratory data, and physical assessment.

H. Identify indications for and the significance and interpretation of currently used and newly developing maternal-fetal assessment techniques. Examples are:

1. chorionic villi sampling
2. doppler flow studies
3. percutaneous umbilical blood sampling (PUBS)

I. Describe indications for and the management of patients receiving currently used and newly developing fetal therapy techniques. Examples include:

1. open procedure to repair neural tube defects
2. needle procedures, such as intrauterine transfusion, bladder stent placement, thoracentesis, and skin biopsy
3. amnioexchange for gastroschisis

J. Explain the importance of screening for domestic violence in the pregnant woman.

K. Identify components which should be included in comprehensive prenatal and childbirth education.

L. Identify indications and resources for prenatal referral.

INTRAPARTAL

III. Demonstrate an understanding of significant issues related to the intrapartal period.

A. Identify the risk status of mother and fetus based on a review of recent history, laboratory data, and a physical assessment, including labor evaluation and pelvic examination, if indicated.

B. Describe the stages and phases of labor.

C. Describe maternal physiologic and psychologic responses to labor.

D. Evaluate the fetal response to labor.

E. Evaluate and promote maternal and fetal well-being, based on assessment of fetal monitor tracings.

F. Outline appropriate emotional and physical support for the laboring woman and significant others.

G. Describe the response of the mother and fetus to commonly used analgesics and types of anesthesia.

H. Identify indications, procedures, and protocols for cervical ripening and/or labor induction/augmentation.

I. Identify, stabilize, and manage the patient with intrapartal complications and recognize indications for referral. Examples of complications include:

1. premature labor
2. premature rupture of membranes

3. cardiovascular abnormalities
4. endocrine abnormalities
5. neurologic abnormalities
6. renal abnormalities
7. hepatic abnormalities
8. pulmonary abnormalities
9. hematologic abnormalities
10. infectious diseases
11. acute obstetric emergencies
12. trauma

J. Describe nursing management of the surgical obstetric patient, both intraoperatively and postoperatively.

K. Describe nursing management of the critically ill obstetric patient who requires the use of high-tech equipment and procedures. Examples are:

1. electrocardiogram interpretation
2. arterial blood gas interpretation
3. mechanical ventilation
4. arterial line placement
5. hemodynamic monitoring

L. Explain the role of the nurse in assisting with the spontaneous vaginal delivery.

M. Identify the legal implications of perinatal nursing, including appropriate documentation.

N. Identify indications and resources for intrapartal referral.

POSTPARTAL

IV. Demonstrate an understanding of significant issues related to the postpartal period.

A. Identify the risk status of the postpartal woman based on a review of recent history, including a labor and delivery summary, laboratory data, and a physical assessment.

B. Describe maternal physiologic and psychologic adaptation to the postpartal period.

C. Outline emotional and physical support necessary for the postpartal woman and her significant others.

D. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.

E. Identify measures to promote infant safety during the hospital stay.

F. Describe nursing care for the breast and/or bottle feeding mother, including strategies to promote success.

G. Describe the risks and benefits of various methods of contraception.

H. Develop, implement, and document postpartal education, including maternal and infant care and family adaptation.

I. Recognize the stages of grief and support the family during the process.

1. Identify normal and pathologic responses to grief.
2. Describe techniques of intervention with families experiencing grief.
3. Institute appropriate referrals as necessary.

J. Identify, stabilize, and manage the patient with postpartal complications and recognize indications for referral.

CONSULTATION/REFERRAL

V. Demonstrate an understanding of significant issues related to consultation and/or referral during the perinatal period.

A. Identify common indications for consultation regarding care and/or transport of the high-risk mother or fetus.

B. Describe the process of initiating consultation/referral with the Regional Perinatal Center.

C. Outline stabilization measures commonly used either prior to or during transport.

NEONATAL OBJECTIVES FOR NURSES IN LEVEL III FACILITIES

NEONATAL OBJECTIVES FOR NURSES IN LEVEL III FACILITIES

The nurse caring for neonatal patients in a Level III facility should be able to:

I. Identify factors from an obstetric history which might cause fetal compromise and evaluate the neonate for physiologic distress.

A. Describe the physiologic changes in the mother which occur during labor.

B. Given patient situations, identify neonates at risk as a result of precipitous or prolonged labor.

C. Identify the most common examples of fetal malpresentation and describe the neonatal problems which might result from each.

D. Given maternal histories, identify maternal problems which might result in a preterm birth.

E. Identify maternal, fetal, and iatrogenic problems which might result in fetal asphyxia.

F. Describe the significance of baseline fetal monitor information and the significance of variations in the fetal heart rate pattern.

G. Describe appropriate antepartal and intrapartal fetal surveillance tests and interpret results.

H. Given a hypothetical situation, identify neonatal sequelae related to:

1. placental abnormalities
2. maternal hypertensive disorders
3. maternal metabolic abnormalities
4. maternal age
5. maternal chemical dependency
6. maternal social-sexual history
7. preexisting maternal medical conditions
8. maternal medications and anesthetics
9. multiple gestation
10. maternal smoking

I. Develop an appropriate neonatal plan of care based on an understanding of the maternal history.

II. Discuss in detail fetal circulation and identify the physiologic changes that occur at birth.

A. Using a diagram, trace blood through the entire fetal circuit and identify the sites of venous admixture that are unique to the fetus.

B. State the role of the placenta in gas exchange.

C. Describe maternal, fetal, and environmental factors which influence placental exchange.

D. Identify or describe the changes which occur at birth in the neonate's cardiovascular system and state the rationale for each change.

E. Explain the interrelationships of blood flow, pressure and resistance.

F. List the effects of the following on resistance in all vascular beds:

1. pH
2. PO_2/SaO_2
3. PCO_2
4. prostaglandins
5. nitric oxide
6. indomethacin
7. tolazoline

III. Manage the newborn's transition to extrauterine life.

A. Manage transition and resuscitation as specified in the most recent edition of the Textbook of Neonatal Resuscitation published by AHA and AAP.

B. Given patient situations, develop a plan of care that would allow early recognition and long-term management of sequelae from asphyxia and cardiopulmonary resuscitation.

C. Develop a management plan for all neonates that would enhance transition from the fetal cardiopulmonary circuit to the neonatal cardiopulmonary circuit.

IV. Perform a comprehensive and systematic assessment of the neonate and take action based on findings.

A. Identify factors that influence the homeostatic range for vital signs and laboratory data during neonatal life.

B. When given a neonate to assess, identify normal physical characteristics and common variations related to:

1. body contour, proportions and posture
2. head (including occipital frontal circumference, fontanelles and sutures)
3. face (including mouth and nose)
4. eyes
5. ears (hearing screen)
6. skin
7. chest
8. abdomen
9. genitalia and rectum
10. extremities
11. vertebral column
12. reflexes

C. When given a neonate to assess:

1. Identify, describe, and locate point of maximal impulse of the heart.
2. Count and record the apical heart rate and respiratory rate.
3. Identify heart murmurs.
4. Auscultate the lungs and describe breath sounds.
5. Identify flaring of the nostrils, retractions, grunting, inspiratory stridor, apnea, gasping, tachypnea, and choanal atresia and relate the significance of these findings to problems experienced by the neonate.
6. Identify placement, strength, and equality of peripheral pulses.
7. Describe abdominal girth and shape, stooling pattern, and voiding pattern.
8. Describe skin turgor, texture, color, and perfusion.
9. Describe muscle tone, level of consciousness, activity, and comfort.
10. Evaluate central and peripheral blood pressure.
11. Perform a complete physical assessment, record findings, identify patient needs, and initiate appropriate action based upon findings.

D. Establish a plan for stabilization and appropriate management of all infants, including those who are critically ill.

E. Describe an education plan that includes infant assessment by the parent at home.

V. Appropriately utilize the neonate's gestational age and fetal growth pattern in managing care.

A. Define the following terms:

1. term neonate
2. preterm neonate
3. postterm neonate
4. small for gestational age
5. large for gestational age
6. appropriate for gestational age
7. low birth weight
8. very low birth weight
9. extremely low birth weight

B. Define the stages of fetal cellular growth and identify developmental problems associated with interference in each stage.

C. Identify infants at increased risk for growth and gestational age complications based upon maternal history.

D. Determine the gestational age of a neonate by utilizing a standardized scoring system.

E. Determine a neonate's growth classification by plotting the birth weight, head circumference, and length on an intrauterine growth chart and interpret significance.

F. State the implications of abnormal intrauterine growth and of non-term birth.
G. Given a variety of patient gestational ages and growth parameters, develop a plan of care which reflects consideration of these issues.

VI. Apply knowledge of thermoregulation in the neonate by maintaining an optimal thermal environment.

A. Define thermal balance.

B. List four physiologic characteristics in the neonate which influence heat loss and describe how each characteristic influences heat loss.

C. List four modes of heat transfer in the neonate, give an example of each, and identify interventions to decrease heat transfer by each of the four modes.

D. When given a patient situation, identify measures to promote a neutral thermal environment.

E. Describe the physiologic process by which the neonate attempts to maintain body temperature.

F. List the physiologic problems which may result from hypo- and hyperthermia.

G. Identify optimal skin and axillary temperatures for both premature and full-term neonates.

H. Compare and contrast methods for monitoring a neonate's temperature with regard to safety and accuracy.

I. Compare and contrast methods of providing external heat for the neonate, including:

1. incubator
2. radiant warmer
3. servocontrol
4. manual control
5. heat packs and mattresses

J. Describe safe and effective methods of raising vapor pressure in the infant's environment.

K. Describe safe and effective methods of decreasing the velocity of air flow over the neonate.

L. Describe safe methods of increasing and decreasing a neonate's temperature.

M. Identify factors other than body temperature which may indicate the status of the neonate's thermal balance.

N. Utilize all thermoregulation equipment safely.

O. Describe appropriate long-term thermal management of the neonate.

P. Describe an education plan that includes appropriate temperature assessment and management by the parents.

VII. Manage the neonate's fluid and nutrition to promote normal growth.

A. Calculate the fluid and caloric needs of the neonate based upon weight, age, physiologic problems, and growth rate.

B. Calculate the appropriate protein, fat, carbohydrate, mineral, and vitamin content for formula needed for neonates of various gestational ages and weights.

C. Discuss the indications and contraindications for initiating oral feeding.

D. When total oral feeding is not an option, develop a plan of care to meet fluid and nutritional needs, including the use of hyperalimentation and intralipid therapy.

E. Describe the advantages, disadvantages, and potential complications of varying the concentration of commercial formulas.

F. Describe appropriate use of human milk, supplements, and commercial formula to meet fluid, nutrient, mineral, and vitamin requirements of neonates.

G. Evaluate a neonate's postnatal growth using a postnatal growth chart and identify appropriate management responses.

H. Develop a plan to teach parents appropriate nutrient and fluid sources and indications that consultation is necessary to alter intake.

VIII. Select the most appropriate technique for feeding the high-risk infant.

A. List advantages and disadvantages of continuous gastric, intermittent gastric, transpyloric, gastrostomy, and nipple feeding, based on knowledge of the infant's physiologic status, gestational age, and weight.

B. Describe safe and effective procedures for feeding infants receiving continuous gastric, intermittent gastric, gastrostomy, and/or nipple feedings.

C. Recognize and report signs of feeding intolerance and differentiate iatrogenic problems from actual changes in the infant's clinical status.

D. Describe the correlation of blood glucose levels to the neonate's feeding regimen.

E. List measures to decrease oxygen consumption, trauma, infection, air ingestion, vomiting, and aspiration in relationship to feeding techniques.

F. Describe methods for assisting the mother with appropriate infant feeding techniques.

IX. Correctly administer all types of intravenous fluids.

A. Calculate the fluid needs of the neonate, based upon weight, age, and physiologic problems.

B. Describe iatrogenic causes of the following:

1. overhydration
2. underhydration
3. infection at intravascular sites
4. clotting of intravascular lines
5. hemorrhage
6. hypoglycemia
7. hyperglycemia
8. infiltration
9. embolism
10. thrombosis

C. Describe nursing measures that will enhance the positive effects and minimize the side effects of the following:

1. peripheral intravenous lines
2. PICC and CVL
3. umbilical venous and arterial lines
4. peripheral arterial lines
5. glucose and electrolyte solutions
6. intravenous fat solutions
7. total parenteral nutrition
8. colloid solutions

X. Anticipate and identify fluid and electrolyte imbalance in the sick neonate.

A. Define normal fluid and electrolyte loads for all neonates.

B. Describe the following mechanisms for control of fluid and electrolyte balance:

1. diffusion
2. osmosis
3. filtration
4. sodium and potassium pump
5. ADH control
6. rennin, angiotensin, aldosterone control
7. atrial natriuretic peptide

C. Recognize clinical histories, major signs, symptoms, and laboratory values associated with the following:

1. hyponatremia
2. hypernatremia
3. hypochloremia
4. hyperchloremia

5. hypokalemia
6. hyperkalemia
7. fluid shifts
8. overhydration
9. dehydration

D. Describe the clinical interventions necessary for the conditions listed in X., C.

E. Given a clinical history, laboratory values, and physical assessment data, delineate an appropriate assessment and treatment plan.

XI. Apply knowledge of acid-base balance in the management of the sick newborn.

A. Identify pathophysiologic changes which result from acidosis and alkalosis.

B. Define pH, acid, base, base excess, and buffer.

C. Describe how blood, respiratory, and renal buffers compensate for acid-base imbalance.

D. Identify acceptable neonatal parameters for blood gas values (pH, PO_2, PCO_2, HCO_3, base excess, and oxygen saturation).

E. Compare and contrast the clinical significance of respiratory gas information obtained from the following sites: capillary, peripheral artery punctures, umbilical artery, transcutaneous probes, end tidal CO_2, pulse oximetry.

F. Differentiate abnormal blood gases that require a change in therapy from those that require continued assessment without a change in therapy.

G. Recognize blood gas reports that indicate the following:

1. compensated and uncompensated metabolic acidosis
2. compensated and uncompensated metabolic alkalosis
3. compensated and uncompensated respiratory acidosis
4. compensated and uncompensated respiratory alkalosis
5. mixed metabolic and respiratory imbalances

H. Describe the etiology of acid-base imbalances in relation to gain or loss of fixed acid, gain or loss of base, gain or loss of carbon dioxide.

I. Describe the relationship of the following to acid-base balance and list measures to optimize each factor.

1. PO_2, PCO_2, base excess
2. diffusion gradient
3. respiratory rate/drive
4. functional residual capacity
5. tidal volume/diffusing surface
6. blood flow
7. Hgb function

8. nutrient supply/sources of acid and base
9. infant and ambient temperature
10. infant activity
11. urinary and GI losses
12. mean airway pressure
13. minute ventilation

J. Describe appropriate use of pharmacologic agents which alter acid-base balance.

XII. Apply knowledge of respiratory physiology in the management of newborns with respiratory disorders.

A. Demonstrate a working knowledge of the terms used to describe respiratory pathology, pulmonary function, and respiratory support.

B. List physiologic events which must occur at birth in order for the lungs to function postnatally and list factors responsible for each event.

C. Describe physiologic factors which enhance or deter respiratory movement.

D. Describe physiologic factors which oppose air entry into the alveoli.

E. Describe how surfactant influences establishment of functional residual capacity (FRC), including factors which may limit or enhance surfactant production.

F. Describe factors which influence the following:

1. closure of patent ductus arteriosus
2. closure of foramen ovale
3. pulmonary arteriolar dilation
4. pulmonary vascular resistance
5. cerebral blood flow

G. Describe medical and nursing measures which may enhance the establishment of respiration.

H. Describe physiologic factors in the premature neonate which limit the establishment of normal respiration.

I. Describe the pathophysiologic changes in and etiology of neonatal respiratory disorders.

J. Describe specific observations, radiologic findings, and laboratory results which would assist in differentiating specific neonatal respiratory disorders.

K. Given specified neonatal respiratory patterns, identify the probable etiology, based on knowledge of gestational age, pathophysiology, and environmental milieu.

L. Describe the indications for the mechanism of action, side effects, and

appropriate administration of pharmacologic agents used in the treatment of neonatal respiratory disorders.

M. Describe nursing management of neonates with respiratory disorders requiring surgical intervention.

XIII. Describe appropriate measures for managing neonatal respiratory support systems.

A. Describe the indications for and the mechanisms of operation of various respiratory support systems.

B. Demonstrate a thorough working knowledge of the neonatal respiratory support equipment used in the facility.

1. Describe clinical indications for altering the following:

a. modes of ventilation
- volume ventilation
- time-cycled pressure-limited ventilation
- controlled mandatory ventilation
- intermittent mandatory ventilation
- synchronized intermittent mandatory ventilation
- patient-triggered ventilation
- assist-control ventilation
- pressure support ventilation
- high frequency oscillatory ventilation

b. oxygen concentration (FiO_2)
c. continuous positive airway pressure (CPAP)/positive end expiratory pressure (PEEP)
d. ventilator rate
e. frequency
f. amplitude
g. inspiratory time
h. % inspiratory time
i. expiratory time
j. I/E ratio
k. peak inspiratory pressure (PIP)
l. mean airway pressure (MAP/Paw)

2. State measures to diminish, identify, and treat the potential complications from settings listed in B., 1.

3. Describe the interrelationships of the ventilator settings listed in B., 1.

C. Describe the complications which may be associated with respiratory support.

D. Develop a management plan that limits the complications of respiratory support.

E. Describe the etiology, specific signs and symptoms, and radiologic findings associated with neonatal respiratory disorders.

F. Describe safe methods of adjusting respiratory support based on the clinical condition of neonate, blood gases, and radiologic findings.

XIV. Plan, provide, and evaluate the care of infants with cardiac disorders.

A. Trace the embryogenesis of cardiac development.

B. Describe the cardiovascular pressure, resistance, and blood flow alterations resulting from cardiac disorders.

C. Describe common cyanotic and acyanotic heart defects in the newborn period.

D. Describe the physiologic problems associated with patent ductus arteriosus.

E. Identify the data base which is necessary to differentiate heart disease from respiratory disease.

F. Describe the indications for, the mechanism of action, and the side effects of common medications used in the treatment of cardiopulmonary disease.

G. Recognize major rate and rhythm abnormalities.

XV. Plan, provide, and evaluate the nursing care of newborns with hematologic disorders.

A. Briefly describe hematopoiesis in the fetus.

B. Describe the characteristics which differentiate adult and fetal hemoglobin.

C. Describe normal neonatal coagulation.

D. Identify normal neonatal values for the following tests:

1. hematocrit
2. hemoglobin
3. platelets
4. bilirubin (direct, indirect, and total)
5. reticulocyte count
6. prothrombin time
7. partial thromboplastin time
8. fibrinogen
9. Coombs (direct and indirect)
10. circulating blood volume
11. red cell morphology

E. Describe how the following may alter laboratory data:

1. gestational age
2. cord clamping
3. delivery technique
4. blood volume
5. transfusion

6. exchange transfusion
7. timing of sample
8. sampling technique

F. Identify etiology, infants at risk, and management plan for:

1. hemorrhage
2. hemolytic disorders
3. coagulation disorders
4. thrombocytopenia
5. polycythemia
6. acute and chronic anemia

G. Describe the formation, transport, conjugation, and excretion of bilirubin.

H. Describe the pathophysiologic changes that may be responsible for intravascular hemolysis, extravascular hemolysis, and impaired hepatic function as related to hyperbilirubinemia.

I. Describe those factors that increase the risk of neurotoxicity due to hyperbilirubinemia.

J. Describe a nursing assessment plan that allows prompt recognition of abnormal bilirubin metabolism and a management plan that reduces the risk of neurotoxicity.

K. Describe a parent teaching plan that encourages prompt recognition and referral for jaundice in the community setting.

XVI. Plan, provide, and evaluate the nursing care of newborns with selected metabolic disorders.

A. Describe the normal pattern of serum glucose changes in the newborn period and utilize this information in planning glucose screens for well neonates.

B. Describe how the following alter serum glucose:

1. gestational age
2. placental glucose transport
3. hormones
4. glycogen storage and release
5. glucose loads
6. protein and fat loads
7. enteral and parenteral nutrition

C. Identify infants at risk for abnormalities in glucose metabolism and describe glucose screening plans appropriate to the risk factors.

D. Describe management plans that maintain a safe serum glucose level and an appropriate growth pattern.

E. Identify infants at risk for abnormalities in calcium and magnesium metabolism.

F. Identify abnormal serum calcium and magnesium levels from lab reports and differentiate those that require immediate intervention from those which should be further monitored.

G. Describe a safe and effective treatment plan for infants who exhibit abnormal calcium, magnesium and glucose metabolism.

H. Demonstrate awareness of rare inborn errors of metabolism.

I. List the components of and the rationale for newborn metabolic screening in the state of Tennessee.

XVII. Plan, provide, and evaluate the nursing care of newborns with gastrointestinal disorders.

A. Characterize the functional limitations of the preterm and term neonates' gastrointestinal tract.

B. List clinical symptoms of gastrointestinal dysfunction.

C. Identify problems outside the gastrointestinal tract which will alter digestion, absorption, and motility.

D. When given a patient situation, differentiate between signs and symptoms of upper and lower gastrointestinal obstructions.

E. When given a hypothetical situation, identify therapeutic measures that will alleviate or diminish gastrointestinal problems.

F. Describe signs and symptoms of pathology which would indicate the need for:

1. holding feedings
2. stopping feedings
3. gastric aspiration
4. gastric suction
5. Hematest on stools
6. reducing substances test on stools
7. enema or suppository
8. changing of infant's position
9. protective covering of exposed organs
10. abdominal girth measurement

G. Discuss the pathogenesis, medical and surgical management, and nursing care of neonatal gastrointestinal disorders.

H. Describe a teaching plan that would assist parents in notifying the physician appropriately of gastrointestinal dysfunction.

XVIII. Identify common sources of perinatal infections, clinical indications of infections, and methods to prevent nosocomial infections.

A. Identify pathways of congenital and nosocomial infections.

B. Utilize maternal history as a basis for planning neonatal infectious disease screening and management.

C. Describe indications of localized and systemic congenital and nosocomial infections in the neonate.

D. Describe how the neonate's immune response predisposes to infection and affects laboratory values.

E. Differentiate those laboratory values and symptoms related to screening for infection that require immediate intervention from those that require further monitoring.

F. Describe a safe and effective management plan for the neonate experiencing or at risk for infection.

G. Describe a management plan that limits the spread of infection in a high-risk nursery.

1. visiting policy
2. isolation
3. cohorting

H. Describe a management plan that appropriately informs parents about immunizations, documents parental consent for immunizations, and provides immunizations at the appropriate time.

XIX. Plan and implement measures to protect sensory neural function and to evaluate the infant's response to care.

A. Compare the central nervous system control of neurologic function of the preterm, term, and older infant.

B. Identify disorders outside the nervous system which alter function of the nervous system.

C. Describe and implement a comprehensive assessment plan which will provide for prevention, early identification and prompt treatment of sensory neural disorders.

1. reflexes
2. posture
3. activity and movement
4. level of consciousness
5. rest and sleep pattern
6. comfort, irritability, pain
7. vision
8. hearing

D. Identify and describe seizure activity and delineate a plan for safe administration of prescribed anticonvulsants.

E. Identify the pathogenesis, recognition, prognosis, and patient management of:

1. microcephaly
2. major chromosomal abnormalities (Trisomy 13-15, 18, 21)
3. congenital and acquired hydrocephaly
4. infection of the central nervous system (prenatal and postnatal)
5. neural tube defects
6. intracranial hemorrhage
7. neurologic sequelae of drugs, hypoxia, acid-base imbalance, electrolyte imbalance, metabolic disorders, and thermoregulation disorders
8. cerebral edema with or without inappropriate ADH
9. hypoxic-ischemic encephalopathy

B. Describe an education plan that includes parent recognition of appropriate sensory neural function for age, necessity for continuing medical assessment, and interventions appropriately used by parents.

XX. Utilize knowledge of neonatal pharmacology to optimize desired drug actions and minimize side effects.

XXI. Describe a management and education plan that promotes infant safety in the hospital and the community for the following:

A. Falls

B. Thermal injury

C. Abuse

D. Trauma while being carried by caretaker

E. Vehicular transport trauma

F. Drowning

G. Asphyxiation

H. Infectious disease

XXII. Utilize parent-infant attachment concepts in dealing with families of sick newborns.

A. Identify prenatal and postnatal factors which may influence parental attachment and caretaking.

B. Recognize and describe behaviors which indicate the status of parent-infant attachment, including the significance of these behaviors.

C. Recognize and describe the stages of the grief process.

D. Describe how the grief process may influence family relationships.

E. Plan and implement nursing measures which will facilitate healthy completion of the grief process.

F. Describe how attitudes of "significant others" influence parental attachment.

G. Plan and implement nursing measures to facilitate parent-infant interaction.

H. Utilize community resources for various aspects of home care support.

XXIII. Utilize techniques that will enhance the development of age-appropriate physical and psychosocial skills.

A. Identify and limit those types of sensory stimulation that may be detrimental to the neonate.

B. In chronically ill infants, delineate a plan that will provide age-appropriate motor skills.

C. Utilize sensory stimuli, positioning and exercise techniques to enhance age-appropriate developmental skills.

D. Describe screening techniques to identify sensory deficits.

E. Identify the nursing role in limiting and managing sensory deficits.

XXIV. Demonstrate an understanding of significant issues related to consultation and/or referral during the neonatal period.

A. Describe the collaborative roles of health care disciplines in providing care to neonates and their families.

B. Identify common indications for consultation regarding care and/or transport of the high-risk neonate.

C. Describe the process for initiating consultation/referral with the Regional Perinatal Center.

D. Outline stabilization measures commonly used either prior to or during transport.

EDUCATIONAL OBJECTIVES FOR NEONATAL TRANSPORT NURSES

EDUCATIONAL OBJECTIVES FOR NEONATAL TRANSPORT NURSES

Educational Objectives for Nurses, Levels I, II, III, Neonatal Transport (the most recent edition), Tennessee Perinatal Care System, Tennessee Department of Health, Maternal and Child Health Section.

The nurse caring for neonatal patients during transport should be able to meet the objectives listed for each of the following categories:

I. Problems of Pregnancy, Fetal Development, Labor and Delivery

A. Obtain, from a referring caretaker, reports of all tests done to determine fetal gestational age and well-being.

B. Utilize data from the maternal/neonatal history as a basis for anticipating problems, planning, and implementing care during transport.

C. Provide for a receiving caretaker, maternal and neonatal data which give adequate history of problems resulting from pregnancy, labor, and delivery, as well as treatment.

II. Resuscitation of the Neonate

A. Provide for a receiving caretaker an accurate record of required resuscitative procedures and the neonate's physiological responses.

III. Physical Assessment of the Newborn

A. Collaborate with other transport team members in obtaining a thorough physical assessment prior to transport.

B. Describe and initiate an assessment plan during transport that will identify infant problems when they are most amenable to intervention.

C. Provide for a receiving physician a complete record of physical assessment, which includes information from the referring care providers as well as the transport staff.

IV. Thermoregulation

A. Explain the effect of environmental factors, e.g., humidity, ambient temperature, and velocity of air flow, on the thermal status of the neonate.

B. Describe safe methods of maintaining, increasing, and decreasing a neonate's temperature in a transport situation.

C. Provide a receiving caretaker with a thorough history of the infant's thermoregulation problems, treatment of these problems, and infant responses to intervention prior to and during transport.

V. Nutritional Requirements of the Neonate

A. Describe the effects of speed, acceleration, and deceleration on gastrointestinal motility and sphincter control.

B. Describe safe means of providing infant nutrition in a variety of transport situations.

C. Obtain from a referring caretaker an accurate nutritional record for the receiving caretaker.

VI. Intravascular Therapy

A. Describe and utilize safe, efficient measures to limit the effects of transport on intravascular therapy.

B. Prepare fluid and blood products that may be required during transport.

C. Record for a receiving caretaker an accurate summary of fluid and blood products infused prior to and during transport.

VII. Medication Administration

A. Provide for a receiving caretaker an accurate record of medications used prior to and during transport and the neonate's responses.

VIII. Fluid, Electrolyte, and Acid-Base Balance

A. Describe the effects of marked changes in humidity, velocity, and pressure on insensible fluid loss and measures to limit these effects.

B. Obtain and record an accurate summary of fluid, electrolyte, and acid-base status prior to and during transport.

IX. Respiratory Disorders of the Newborn

A. Describe the effects of altering atmospheric pressure, altitude, temperature, and humidity on neonatal respiratory function and discuss nursing measures to minimize these effects.

B. Select and utilize respiratory measures, pharmacologic agents, intravenous orders, and infant positioning to assist in lessening or preventing the disorders listed above.

C. Obtain an accurate history of respiratory status and respiratory support provided prior to transport and develop an ongoing record of assessment, evaluation, and respiratory support for the receiving center.

X. Respiratory Support System

A. Determine the settings to be used when the infant is switched from:

1. a pressure-cycled to a time-cycled/pressure-limited ventilator
2. a time-cycled/pressure-limited ventilator to a pressure-cycled ventilator
3. a volume-cycled ventilator to a pressure-cycled ventilator

B. Set up and correctly utilize respiratory support and monitoring equipment used during transport.

XI. Hematologic Disorders of the Newborn

A. Collaborate with the Transport Team Leader in obtaining reports or specimens for a hematologic data base, including information on the treatment of these disorders prior to and during transport.

B. Collaborate with the referral center in obtaining blood or blood products, which may be required during transport to the receiving center.

C. Provide for a receiving caretaker an accurate hematologic history, including treatment during transport.

XII. Gastrointestinal Problems of the Newborn

A. Identify the special techniques and measures required to limit the side effects of gastrointestinal obstructions and/or abdominal wall defects during transport.

B. Provide for a receiving caretaker a history of gastrointestinal function, treatment, and neonatal response prior to and during transport.

XIII. Perinatal Infection

A. Collaborate with the Transport Team Leader in providing the different components of a septic work-up in a safe and timely manner.

B. Develop and implement procedures which will enhance prevention of infection in transport situations.

C. Obtain from a referring caretaker and provide for the receiving caretaker a history which identifies a neonate's risk of infection.

XIV. Cardiac Disorders of the Neonate

A. Design and implement a plan of care that will provide maximum protection from hypoxic damage for the infant who has cardiac disorders.

B. Provide for a receiving caretaker a thorough report of cardiovascular problems, treatment, and neonatal condition prior to and during transport.

XV. Parent-Infant Relationships

A. Describe and utilize measures which will enhance a positive relationship between parents and health care personnel in the referring and receiving centers.

B. Describe the potential effects of transport on the development of a positive parent-infant relationship.

C. Describe and utilize measures that will minimize the negative effects of transport on parent-infant bonding.

D. Provide for a receiving caretaker a report of significant parent, neonate, and staff interactions.

XVI. Referring-Receiving Caretaker Relationships

A. When given a report by a referring caretaker, anticipate and rapidly request information necessary to provide continuous expert care.

B. Collaborate with other nurses in the perinatal region in developing transport plans which provide comprehensive, continuous, and expert care.

C. Describe the general types of services available in Level I, II, and III newborn facilities.

D. Identify and communicate effectively the attributes and limitations of Level I, II, and III facilities in the region.

E. Describe, utilize, and communicate to others appropriate procedures for initiating consultation, referral, and transport.

F. Describe and prepare the written records required prior to transport.

G. Identify and evaluate communication patterns in the transport region.

H. Seek and accept constructive evaluation of the referral process from nurses in Level I, II, and III facilities.

I. Utilize constructive criticism and effective communication skills as a basis for improving individual care, improving continuity of expert care within the regional center, and improving care of infants referred to and received from other facilities.

XVII. Transport Safety

A. Describe those factors which must be considered in the selection of a vehicle and professional personnel for transport.

B. Describe and utilize effective techniques for securing transport equipment and compressed medical gas tanks in transport vehicles.

C. Determine adequacy of illumination in transport vehicles.

D. Provide continuous visibility of the infant, support equipment, and monitors during transport.

E. Determine that space available in the transport vehicle is adequate for safe emergency intervention during transport.

F. Describe briefly the effects of vibration and sound level on the infant in transit and develop a plan to diminish these effects.

G. Determine the adequacy of power sources to assure uninterrupted power availability during transport.

H. State the potential hazards of vehicle acceleration, deceleration, and speed on the transported infant and take appropriate measures to limit their occurrence, including an appropriate restraint system.

I. Determine and provide an adequate supply of oxygen and air required for transport.

J. Describe and utilize effective methods for testing equipment function prior to transport.

K. Identify and provide the life support and monitoring equipment and consumable supplies necessary for transport.

L. Implement a plan which provides for replacement, cleaning, and maintenance of transport vehicle, equipment, and supplies.

M. Communicate an infant assessment which will assure adequate professional support and equipment upon the arrival of the transported infant at the receiving center.

N. Describe to others and utilize appropriate steps for stabilizing the infant prior to transport.

O. Utilize the vehicle communication system effectively in obtaining consultation from other professional personnel during transport.

P. Maintain records which can be readily utilized to evaluate the effectiveness of the transport system.

Q. Assist in evaluation and implement measures to improve the transport process.